



## Network Traffic Requirements Review



# ESDIS Traffic Requirements Status Review

July 10, 2001



# Network Traffic Requirements Review



## Agenda

- Major Network Requirements Changes Since November 2000 Review
- Continuing and Future Activities
- Detailed Mission/Project Review
- Next Steps



## Network Traffic Requirements Review



# Major Network Requirements Activities and Changes Since November 2000 Review



## Network Traffic Requirements Review



### Completed Requirements Activities Since November 2000 Review

- Provided Tier 2 information to NASA Integrated Services Network (NISN) to enable Project Service Level Agreement (PSLA) development
- Completed ESDIS Traffic Requirements Database (ETRD) modification that allows inclusion of application overheads and exclusion of network protocol and utilization overheads
- Incorporated Abilene flow requirements into the ETRD



## Network Traffic Requirements Review



### Completed Requirements Activities Since November 2000 Review (continued)

- Identified and implemented process for communicating individual requirements that are included in each roll-up provided as input to the ESDIS PSLA
  - Implemented a Roll-up Details report in the ETRD
- Completed web-based ESDIS Requirements Query Tool located on the EMSn website
- Incorporated 18 additional Database Change Requests (DCRs), including Tier 2 information



## Network Traffic Requirements Review



# Continuing and Future Activities



## Network Traffic Requirements Review



### Continuing Requirements Activities

- Track NISN Service Requests (NSR) against requirements and monitor status
- Monitor and assess network requirements for implementation in support of the EOS Mission Ground System
- Refine and document implementation assumptions



## Network Traffic Requirements Review



### Continuing Requirements Activities (continued)

- Monitor the transition of science data flows to the Abilene Network
- Continue implementation of the voice requirements documentation strategy
  - This strategy was presented in the November 2000 review
  - Efforts to better understand implementation of voice requirements are underway
  - The best method for incorporating voice requirements into the ETRD must be determined





## Network Traffic Requirements Review



### Future Requirements Activities

- Incorporate NISN pricing policy for FY02 into the ETRD automated price generation
- Begin to define transition and implementation strategy for transitioning science data flows to the vBNS+ network



## Network Traffic Requirements Review



### Ongoing ETRD Enhancements Activities

- Working to enable automatic calculation of costs for requirements that are priced based on rate tables
- Working to enable tracking of tail circuit costs, including service provider prices
- Incorporating implementation information with links to network requirements in ETRD
- Performing additional database 'cleanup' when needed



## Network Traffic Requirements Review



# Detailed Mission/Project Review



## Network Traffic Requirements Review



### EOS Missions/Projects with Specific Changes

Project	Project Lead	Start Date	End Date
Aqua	J. Underwood	7/15/2001	7/15/2006
Aura	A. Smith	6/24/2003	6/24/2008
ECS Outflows	J. Underwood	N/A	
EO-1	J. Matalavage	11/21/00	11/21/02
ICESat	J. Matalavage	12/15/2001	12/15/2006
Key Scientist	J. Matalavage	Various	1/1/2020
Terra	T. Perrotto	12/1/1999	1/1/2005
TRMM	J. Underwood	11/28/97	11/19/2000

\* Additional missions were affected by global DCRs only; thus, they will not appear as a separate section



## Network Traffic Requirements Review



### EOS Missions and Projects with No Current or Pending Mission-Specific Changes

Project	Project
Acrimsat	Meteor/Sage III**
ADEOS-II**	NPP
ECS InterDAAC	QuickScat**
EDOS**	RadarSat**
ESDIS Institutional	SEASTAR/SEAWIFS
FOO	TOMS
Jason-1 (Basic User Requirements Only)	UARS
LandSat-7**	

\*\*Missions affected by global DCRs but not by mission-specific changes; thus, they do not appear as separate sections



# Network Traffic Requirements Review



## Global DCRs



## Network Traffic Requirements Review



### Global DCRs Since November 2000 Review

DCR#	DCR Title	DCR Description	Information Source
189	Premium-routed Data POP FY02 Updates	Updates and changes associated with POP FY02 preparation	BA&H POP Analysis (06/04/2001)
190	Standard-routed Data POP FY02 Updates	Updates and changes associated with POP FY02 preparation	BA&H POP Analysis (06/04/2001)

- Several missions were affected by these global DCRs, including:
  - ADEOS-II
  - Aqua
  - Aura
  - ECS-Outflows
  - EDOS
  - EO-1
  - EPGN
  - ICESat
  - LandSat-7
  - Meteor/SAGE II
  - QuikScat
  - RadarSat
  - Terra
  - TRMM



## Network Traffic Requirements Review



### Future Global DCRs

- Implement and track service providers in the ETRD (e.g., Abilene, vBNS+, CSOC, etc.)
- Incorporate requirements for commercial ground stations in Alaska and Norway
- Add mission voice requirements to ETRD based on Voice Tracking Strategy





# Network Traffic Requirements Review



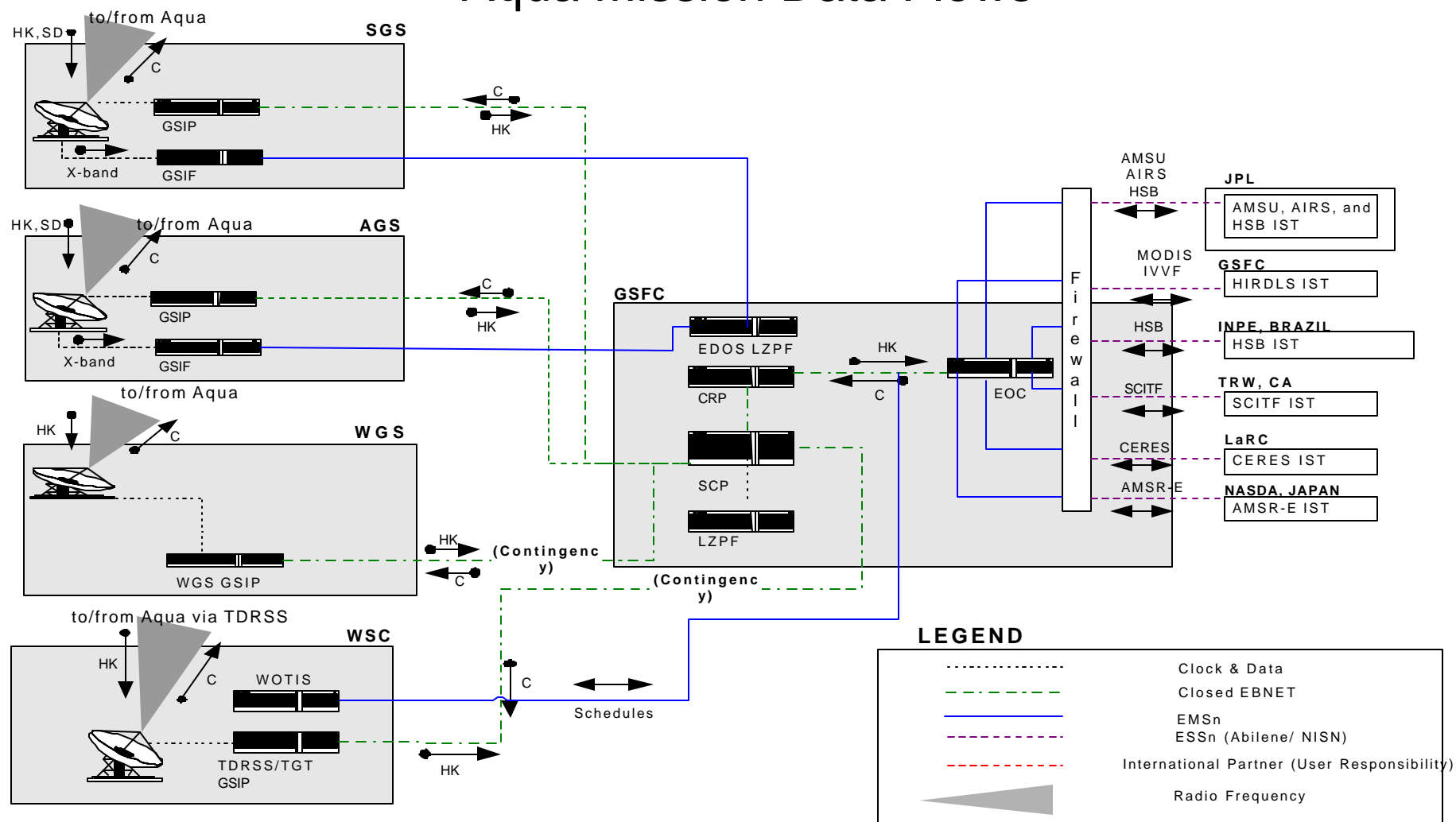
## Aqua



# Network Traffic Requirements Review



## Aqua Mission Data Flows

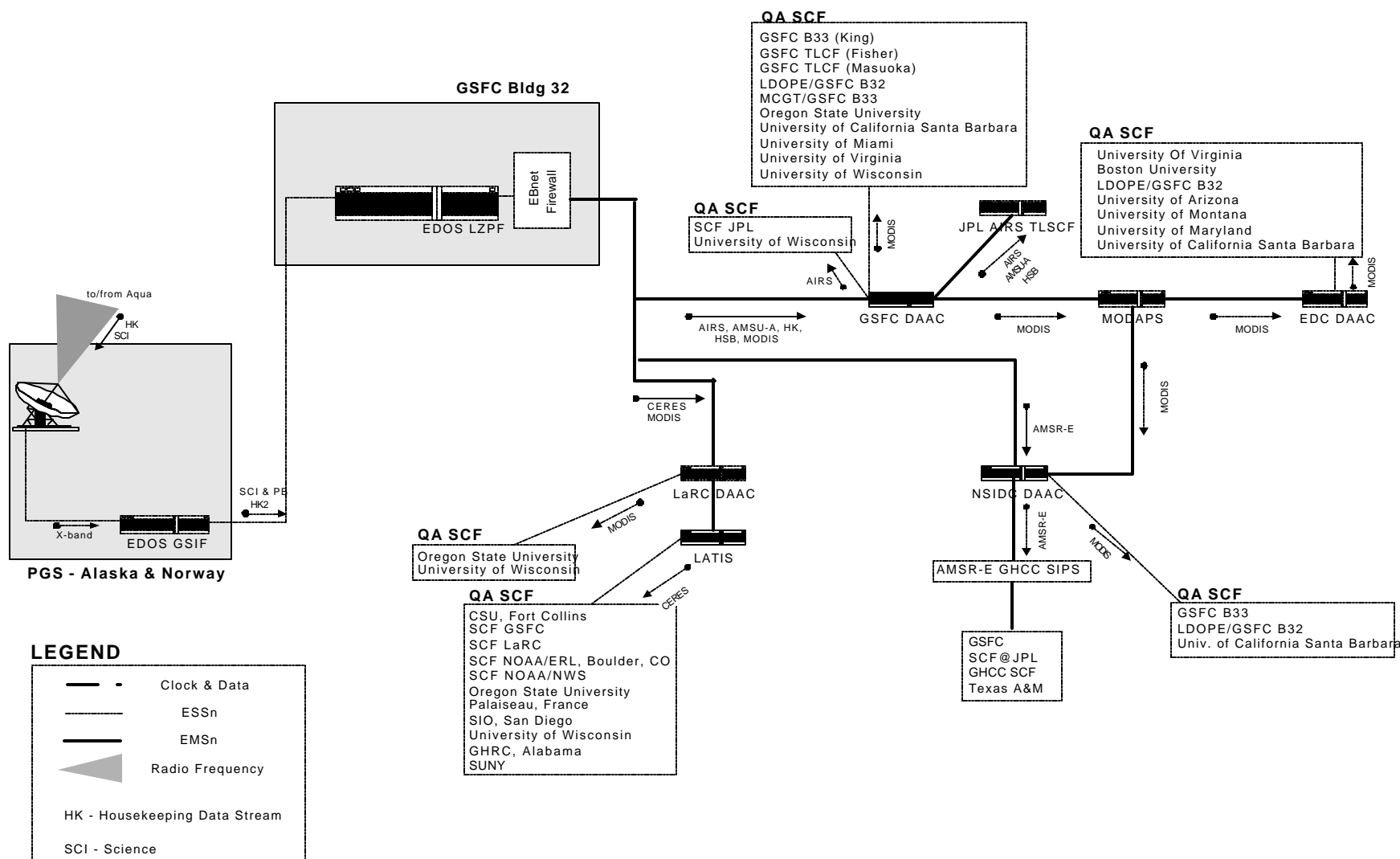




# Network Traffic Requirements Review



## Aqua Science Data Flow





# Network Traffic Requirements Review



## Aqua Milestones

Mission Milestones			
Date	Milestone	Date	Milestone
10/30/2000	Launch minus 14 months	01/30/2003	Launch plus 1 year
01/30/2001	Launch minus 12 months	01/30/2004	Launch plus 2 years
07/30/2001	Launch minus 6 months	01/30/2005	Launch plus 3 years
09/30/2001	Launch minus 4 months	01/30/2006	Launch plus 4 years
10/30/2001	Launch minus 3 months	01/30/2008	Terminate on-orbit operations
11/30/2001	Spacecraft at VAFB	01/30/2009	Launch plus 6 years
01/30/2002	Launch		

\* Milestone dates have changed since November 2000 Review



# Network Traffic Requirements Review



## Aqua Milestones (continued)

Inter-DAAC Milestones	
Date	Milestone
7/30/2001	Launch minus 6 months
01/30/2003	Launch plus 1 year at 50% processing
01/30/2004	Launch plus 2 years at 75% processing
01/2005 - 01/2007	Assumption that data for years 2005 - 2007 are the same as for 2004
01/30/2008	End of Mission: 100% processing
01/30/2003 (L+ 1 yr) – 01/30/2004 (L +2 yrs)	1 x 75% reprocessing
01/30/2004 (L +2 yrs) – 01/30/2008 (EOM)	2 x 100% reprocessing

\* Milestone dates have changed since November 2000 Review



# Network Traffic Requirements Review



## Aqua DCRs

DCR#	DCR Title	DCR Description
173	Change Aqua Inter-DAAC Milestones	Change Aqua Inter-DAAC milestones to reflect launch slip and EOS Handbook
185	Aqua SIPS Correction	Make corrections to the NISN service and Source/Destination
186	Aqua AIRS TLSCF Logical Network and STD Service	Change logical network from EMSn to ESSn and change NISN service from Premium to STD
187	Aqua Milestone Updates	Update Aqua milestones
188	Aqua IST	Add Aqua IST requirement to the ETRD



## Network Traffic Requirements Review



### Aqua Information Sources

Information Source	Date of Source
MODAPS SIPS ICD	1/2000
AMSR-E SIPS ICD	3/2000
Assumptions and Guidelines Handbook for EPOS Network Requirements	10/2000
ESDIS Level 2 Requirements for Overall EOS Ground System, Volume 0, Appendix D	3/2000
AIRS SIPS ICD	4/2000
Aqua GSRD	6/2000
Basic Assumptions and Guidelines Handbook for EOS Networks Requirements, Version 1.0	5/1/2001
ESDIS Site Version 4 (EOSNAPS 25-June-01A6.xls) (provided by Andy Germain)	6/25/2001



## Network Traffic Requirements Review



### Future Aqua Changes

- Change Aqua milestone to reflect launch slip (to current 1/30/2002 launch date)





# Network Traffic Requirements Review



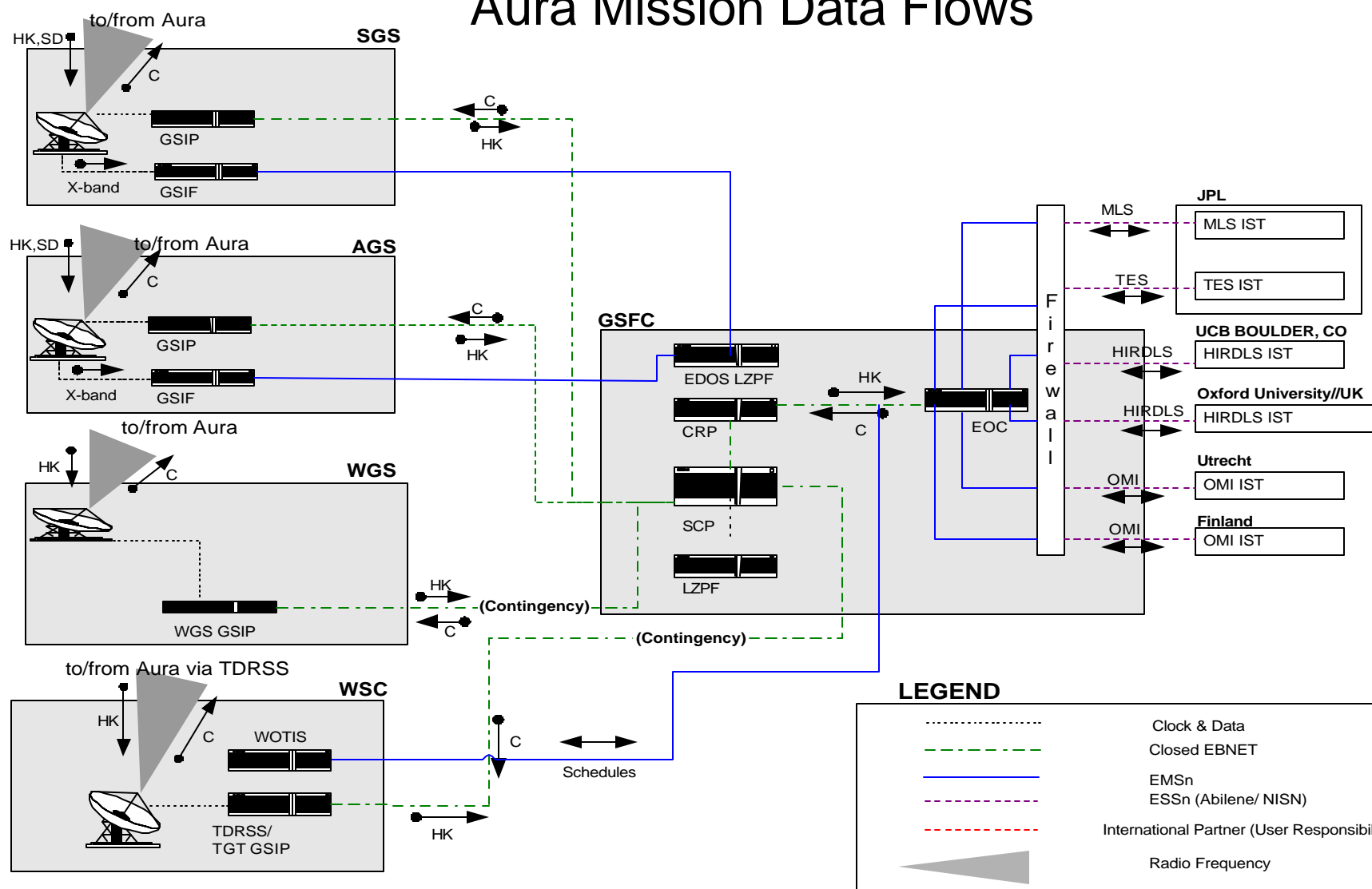
## Aura



# Network Traffic Requirements Review



## Aura Mission Data Flows

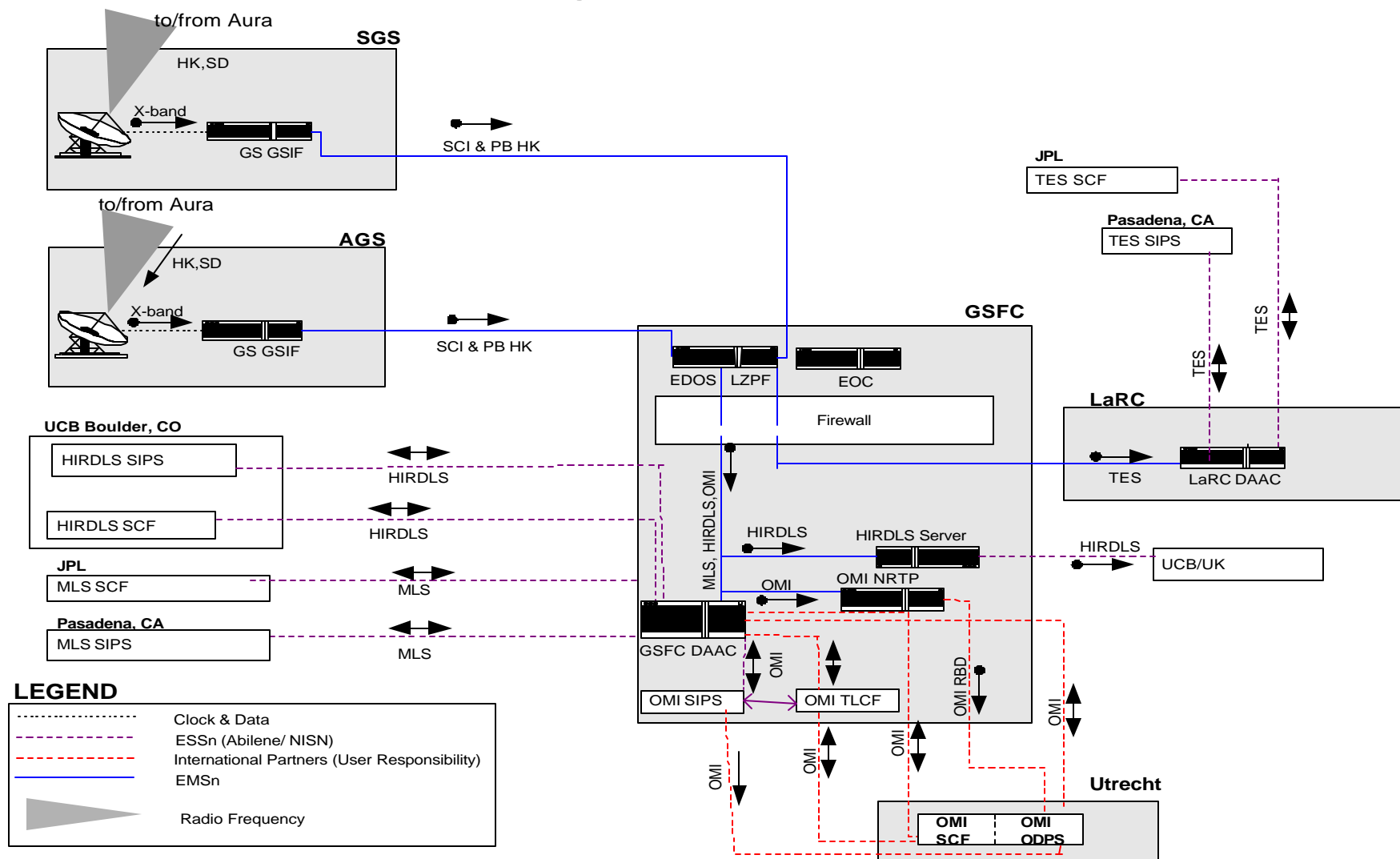




# Network Traffic Requirements Review



## Aura Science Data Flows





# Network Traffic Requirements Review



## Aura Milestones

Mission		Inter-DAAC	
Date	Milestone	Date	Milestone
12/31/2002	Begin Prelaunch Activities	01/2003	Inter-DAAC Launch
03/24/2003	Launch minus 3 months - Basic User Flows		
04/24/2003	Spacecraft to VAFB		
05/24/2003	Launch minus 1 month		
06/24/2003	Launch		
06/24/2008	Terminate On-Orbit Operations		



## Network Traffic Requirements Review



### Aura DCRs

DCR#	DCR Title	DCR Description
179	Update Aura OMI and HIRDLS Data Flows	Update Aura OMI and HIRDLS Data Flows
193	AURA: Mutually Exclusive Updates	Update Aura mutually exclusive fields based on the POP scrub

**No Changes Pending**



# Network Traffic Requirements Review



## Aura Information Sources

Information Source	Date of Source
ESDIS Level 2 Requirements for Overall EOS Ground System, Vol. 0, Appendix D	3/2000
Basic Assumptions and Guidelines Handbook for EOS Network Requirements	5/2001
EOS Aura Mission Specific Requirements Document (MSRD)	6/2001
EOS Aura Operations Concept Document	8/2000
Aura Delta Spacecraft-CDR	9/2000
ICD ECS and SIPS: MLS ECS Data Flows	7/2000
Working Agreement Between the ESDIS Project and the AURA HIRDLS Science PI for Standard Data Production Using the HIRDLS SIPS	11/2000



# Network Traffic Requirements Review



## ECS - Outflows



## Network Traffic Requirements Review



### ECS - Outflows Milestones

Date	Milestone
01/01/1999	Start of DAAC outflows
01/01/2000	Flow ramp up
01/01/2001	Flow ramp up
01/01/2002	Flow ramp up
01/01/2006	DAAC outflow end date

\* Milestone dates have changed since November 2000 Review





## Network Traffic Requirements Review



### ECS - Outflows DCRs

DCR#	DCR Title	DCR Description
172	Change ECS-Outflow end date	Change EOM milestone date to be Aura EOM plus 3 years
177	ECS Standard - DAAC Outflow raw average data rate	Update ECS standard DAAC Outflow raw average speed
178	ECS Standard Deletions: DREN, NJ NAP, EDC, Boulder	These destinations were incorporated in other peering points based on source listed

**No Changes Pending**



## Network Traffic Requirements Review



### ECS - Outflows Information Source

Information Source	Source Date
Budget Model Baseline Version 5.1	2/1998
ESDIS Site Version 4 (EOSNAPs 25-June-01 A6.xls) (provided by Andy Germain)	6/25/2001



# Network Traffic Requirements Review



## EO-1



# Network Traffic Requirements Review



## EO-1 Milestones

Date	Milestone
11/21/00	Launch Date
11/21/02	End of Mission

\* Milestone dates have changed since November 2000 Review



## Network Traffic Requirements Review



### EO-1 DCRs

DCR#	DCR Title	DCR Description
174	EO-1 Launch Date Slip	Change EO-1 Launch date to reflect slip

**No Changes Pending**



## Network Traffic Requirements Review



### EO-1 Information Source

Information Source	Date of Source
EO-1 DMR	03/31/1999



# Network Traffic Requirements Review



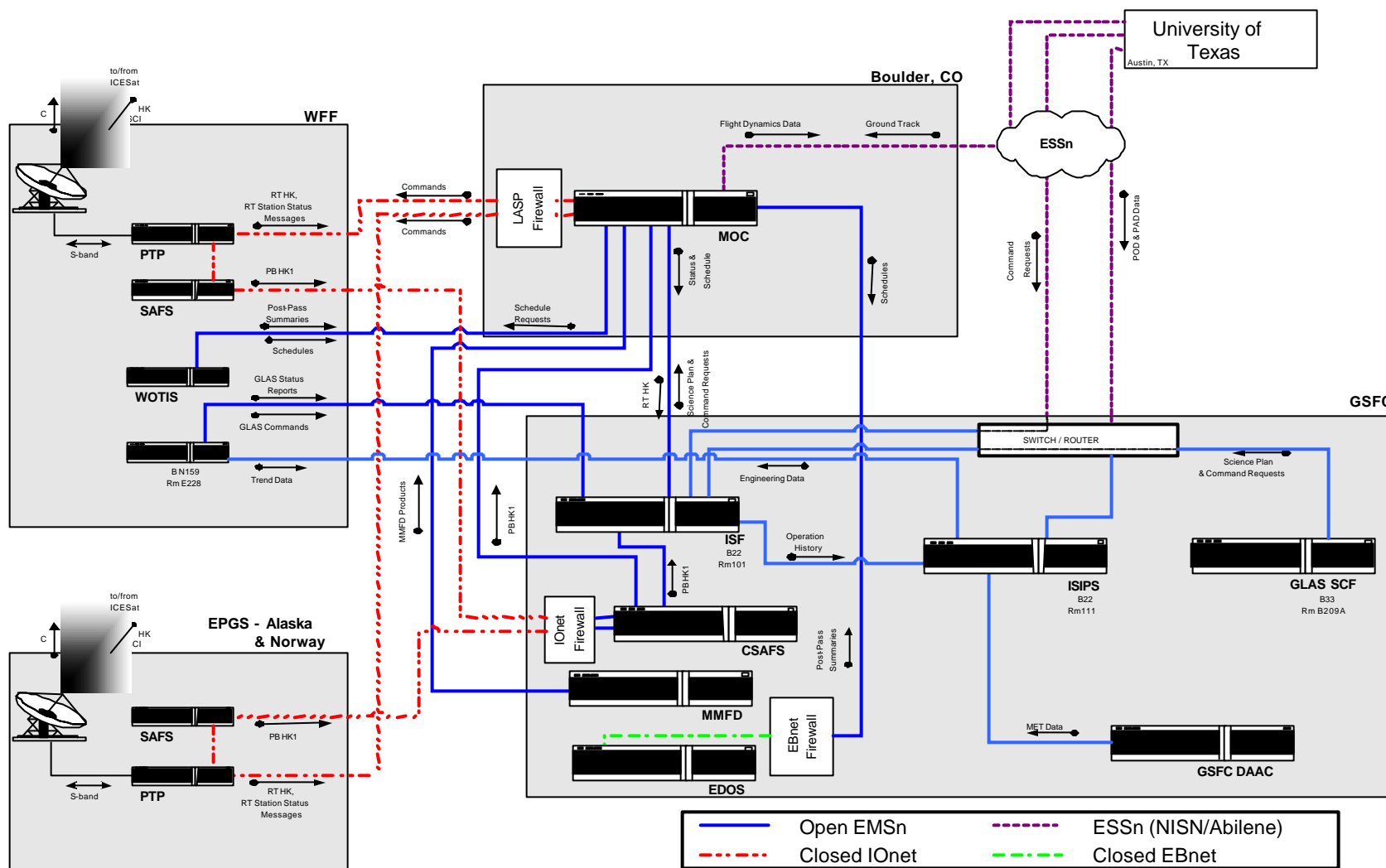
## ICESat



# Network Traffic Requirements Review



## ICESat Mission Data Flows



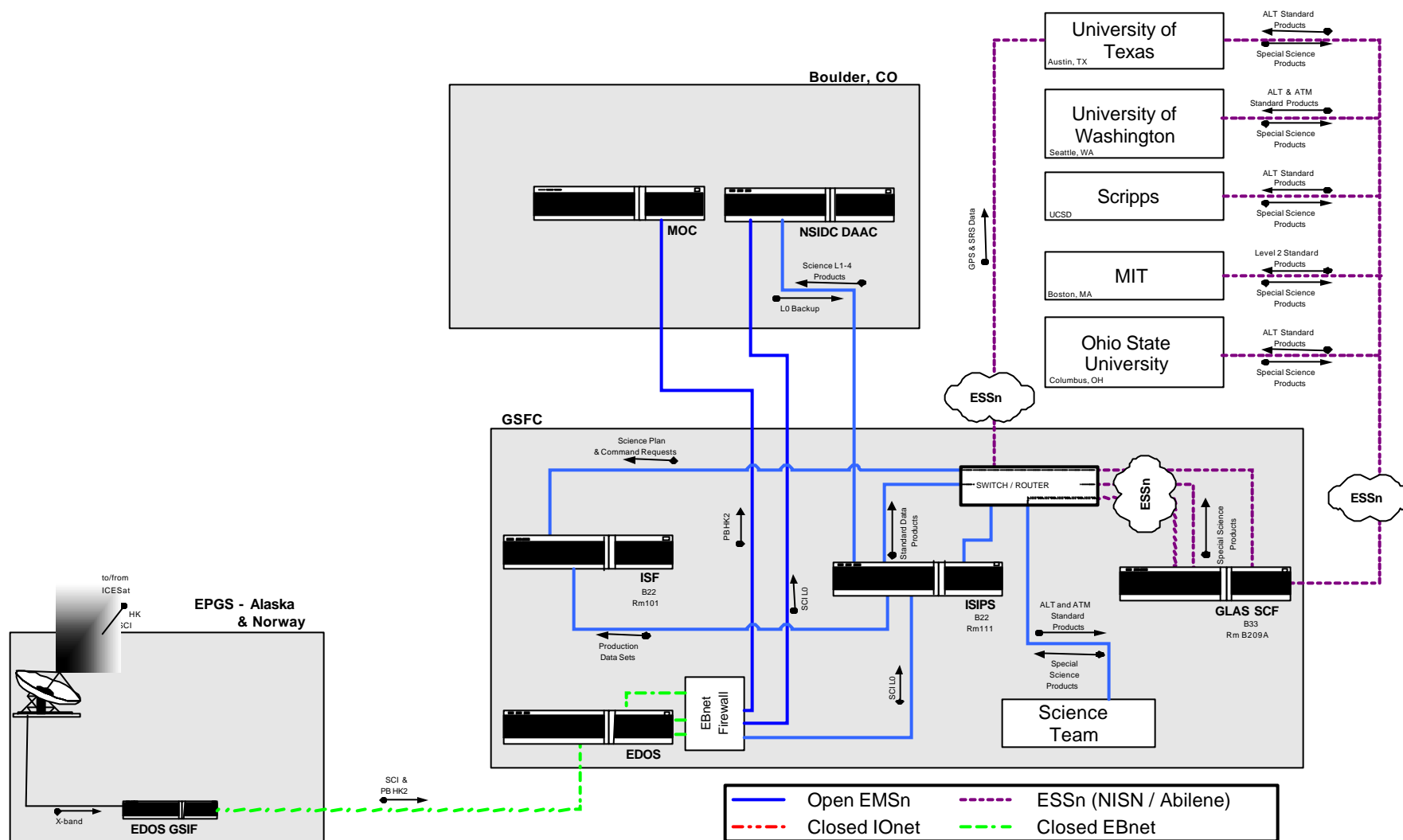




# Network Traffic Requirements Review



## ICESat Science Data Flows





# Network Traffic Requirements Review



## ICESat Milestones

Mission		Inter-DAAC	
Date	Milestone	Date	Milestone
06/15/2001	Launch minus 6 months	01/01/2001	Launch minus 6 months
12/15/2001	Launch	04/01/2001	Launch minus 3 months
12/15/2002	Launch plus 1 year	07/01/2002	Start Year 2
12/15/2003	Launch plus 2 years	07/01/2003	Start Year 3
12/15/2004	Launch plus 3 years	07/01/2004	End of Mission
12/15/2005	Launch plus 4 years		
12/15/2006	Terminate On-Orbit Operations		
12/15/2007	Launch plus 6 years		



# Network Traffic Requirements Review



## ICESat DCRs

DCR#	DCR Title	DCR Description
175	Update ICESat Sources	Update source field
191	ICESat Scrub	Many changes resulting from multiple scrubs by Jill Matavalage, Gordon Knoble, Jeff Smith, and David Hancock



## Network Traffic Requirements Review



### Future ICESat Changes

- Incorporate ICESat launch slip (from 12/15/2001 to no earlier than 03/30/2002) as indicated by the Mission Readiness Test Team (MRTT) as well as NASA's launch schedule web page



## Network Traffic Requirements Review



### ICESat Information Sources

Information Source	Date of Source
Volume 0, Appendix D	3/2000
ICESat Mission Operations Requirements Document (MORD)	3/2001
Data Flow Requirements Spreadsheet agreed upon by David Hancock, Gordon Knoble, and Jeff Smith	4/2001
Interface Requirements Document (IRD) between EDOS and EOS Ground Elements	2/14/2000
Verification through discussions with various ICESat project members	Various



# Network Traffic Requirements Review



## Key Scientist



# Network Traffic Requirements Review



## Key Scientist Milestones

Date	Milestone
06/30/1993	Start Date
01/01/2020	Stop Date



## Network Traffic Requirements Review



### Key Scientist DCRs

DCR#	DCR Title	DCR Description
184	Remove Key Scientist Requirements	Make project inactive

**No Changes Pending**





## Network Traffic Requirements Review



### Key Scientist Information Source

Information Source	Date of Source
Email indicating agreement between Andy Germain and Gordon Knoble to remove Key Scientist Requirements from ETRD	02/02/2001



# Network Traffic Requirements Review



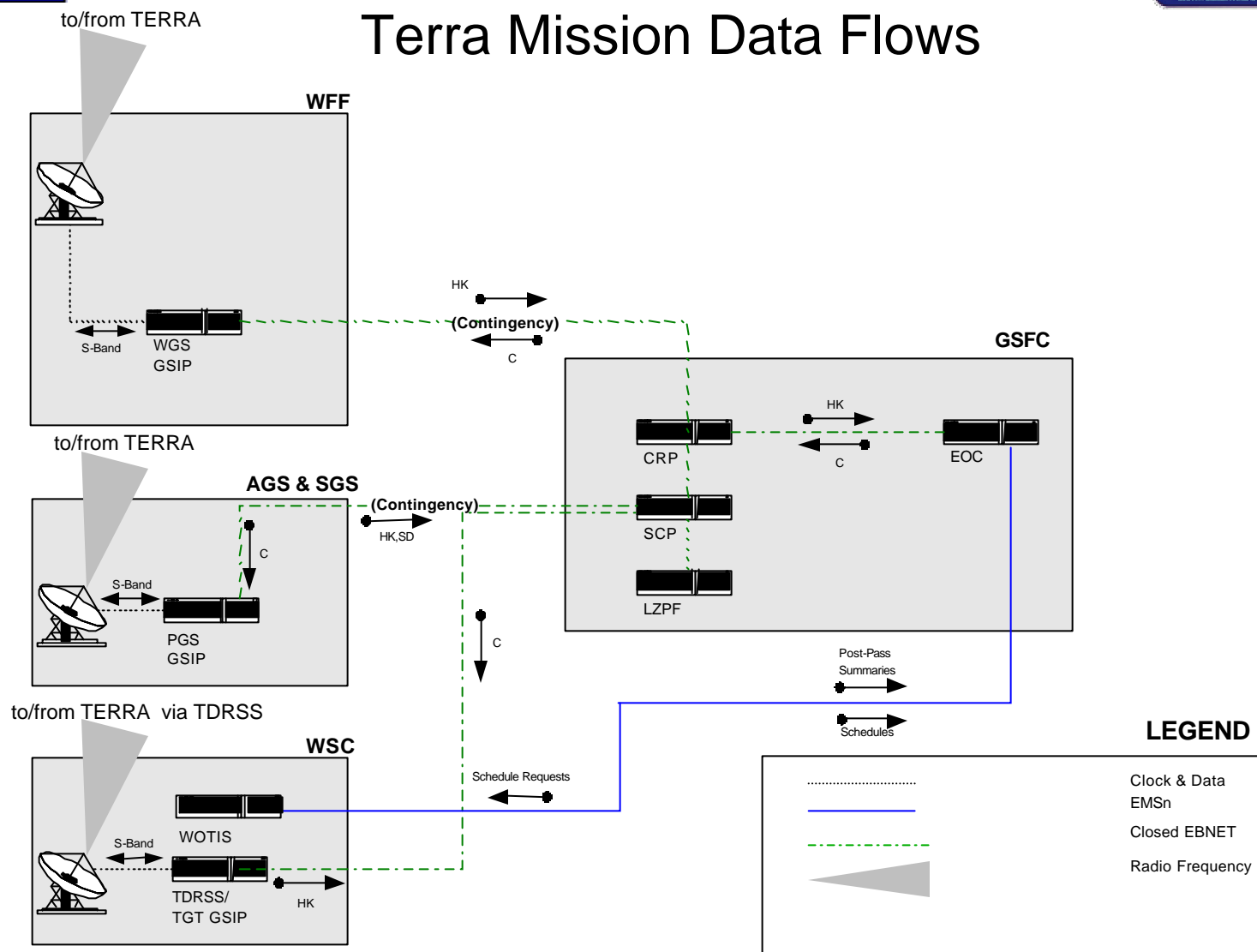
## Terra



# Network Traffic Requirements Review



## Terra Mission Data Flows







# Network Traffic Requirements Review



## Terra Milestones

Date	Milestone	Date	Milestone
5/1/1997	Inter-DAAC, Terra Start Support and Year 1	7/28/2000	Inter-DAAC Terra, Start Year 2 (original)
3/01/1999	Inter-DAAC Terra Launch minus 3 months (original)	1/01/2001	Inter-DAAC Terra, New Start Year 2 (revised)
7/01/1999	Inter-DAAC Terra New Launch minus 3 months (revised)	7/28/2001	Inter-DAAC Terra, Start Year 3 (original)
12/01/1999	Launch	01/01/2002	Inter-DAAC Terra, New Start Year 3 (revised)
1/01/2001	CMD and TLM to IP at WSC	7/28/2004	Inter-DAAC Terra End of Mission
1/01/2001	CMD and TLM to IP at SGS CMD and TLM to IP at AGS	01/01/2005	Inter-DAAC Terra New End of Mission
1/01/2001	CMD and TLM to IP at WFF	01/01/2005	Terminate On-Orbit Operations



# Network Traffic Requirements Review



## Terra DCRs

DCR#	DCR Title	DCR Description
192	Update Data Rates for Terra and TRMM	Update current data rates to 56Kbps for ReqIDs 4891, 4892, 5440, 5441, and 5491

**No Changes Pending**



# Network Traffic Requirements Review



## Terra Information Source

Information Source	Date of Source
BA&H POP Analysis	06/04/2001



# Network Traffic Requirements Review



## TRMM





# Network Traffic Requirements Review



## TRMM Milestones

Date	Milestone
1/01/1996	Start Prelaunch
8/28/1997	Launch minus 3 months
10/28/1997	Launch minus 1 month
11/28/1997	Launch
12/19/1997	Complete Early On-Orbit Testing
Q4 2005**	Terminate On-Orbit Operations
1/01/2020	End of Processing - 2020

\* Milestone dates have changed since November 2000 Review

\*\* Exact date not available. Mission may not be funded through 2005



## Network Traffic Requirements Review



### TRMM DCRs

DCR#	DCR Title	DCR Description
192	Update Data Rates for Terra and TRMM	Update current data rates to 56Kbps for ReqIDs 4891, 4892, 5440, 5441, and 5491

**No Changes Pending**



# Network Traffic Requirements Review



## TRMM Information Source

Information Source	Date of Source
BA&H POP Analysis	06/04/2001
Discussion with Mike Shaub	07/11/2001



# Network Traffic Requirements Review



## Next Steps



## Network Traffic Requirements Review



### Next Steps

- Complete implementation of the voice requirements documentation strategy
  - Obtain better understanding of the implementation of voice requirements
  - Determine the best method for incorporating voice requirements into the ETRD
- Incorporate requirements for commercial ground stations in Alaska and Norway
- Incorporate network requirement implementation links in the ETRD